Harita Seating Systems Limited

Hosur, (Tamilnadu)

Unit Profile

Harita ***is the Sanskrit word for verdant prosperity***. Harita Seating Systems Limited (HSSL) established and promoted by members of TVS family to provide customized seating solutions, taking into account the difficult Indian road conditions. Commercial production was started in 1988 and the company soon went public. HSSL had developed in-house competence in seat technology relevant for Indian market through the product launches made in the past decade.

HSSL is the only seat manufacturer to provide complete seating solution to all segments of automotive industry by serving more than 50 major customers across India with 170 products and 368 variants along with add on features in nine different segments. HSSL continue to strive to exceed customer's ever increasing expectation by developing innovative products. This posses a challenge to continuously improve in all spheres of business.

HSSL has been consistently growing right from inception from a level of 14 lakhs and closed the last financial year (FY05) with a figure of 119 crores of turnover.

Energy consumption

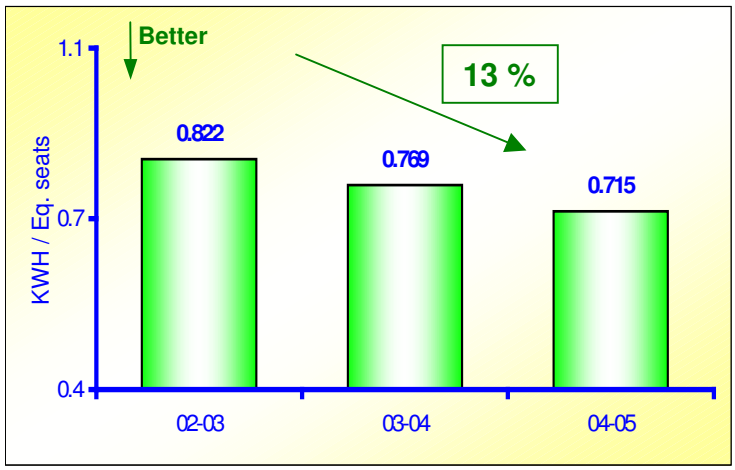
Thanks to the implementation of various energy conservation initiatives, there has been a significant decline in energy consumption at HSSL in the last 3 years which is evident from the below table:

Description	Units	2002-03	2003-04	2004-05
Annual production (equivalent seats)	Numbers in Lakhs	18.51	22.25	27.41
Total energy consumption/annum	Lakhs kWh	15.22	17.11	19.61
Specific energy consumption – Electrical	kWh / Eq.seats	0.822	0.769	0.715
Total thermal energy consumption / annum	Million kCal	1364	1412	1302
Specific energy consumption – Thermal	Million kCal / Eq.seats(Lakhs)	73.7	63.45	47.5
Energy cost as % of total manufacturing cost	Percentage	13.8	13.2	12.5

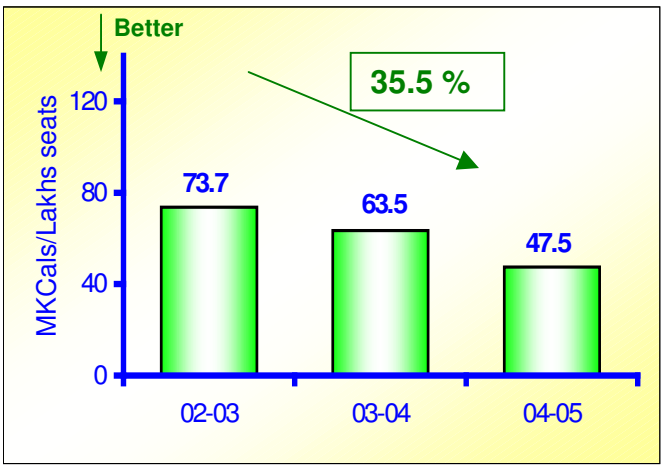
Reduction in specific energy consumption (SEC) per equivalent seat in last 3 years

Year	Electricity		Thermal	
	Consumption (kWh/ Eq. seats)	% of reduction over 2002-2003	Consumption (kCal / Eq. Seats)	% of reduction over 2002-2003
2002-2003	0.822	-	737	-
2003-2004	0.769	6.45 %	635	13.84 %
2004-2005	0.715	13.02 %	475	35.55 %

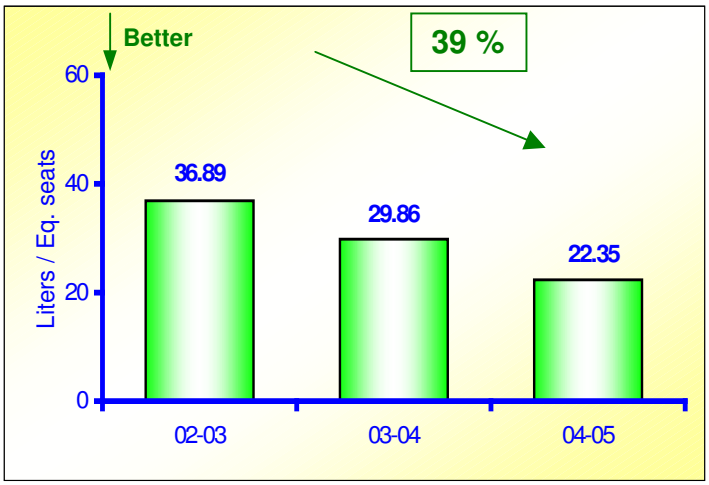
ELECTRICAL CONSUMPTION



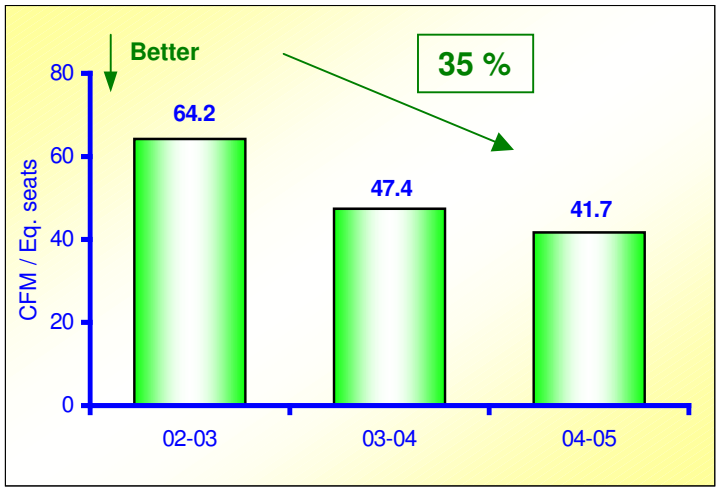
THERMAL CONSUMPTION



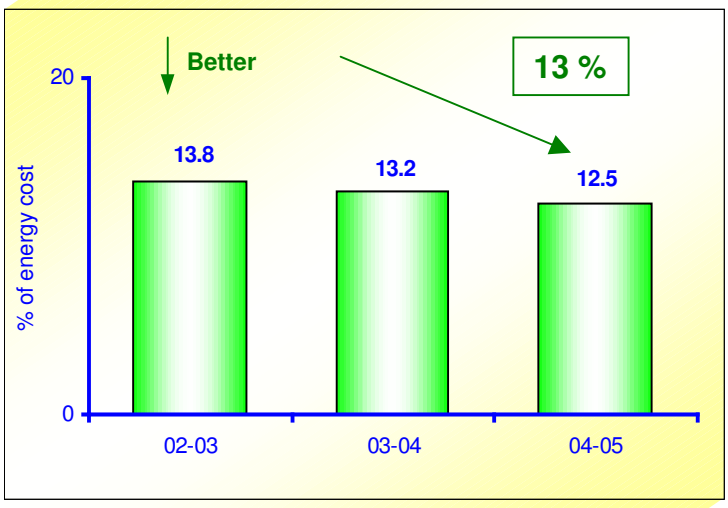
WATER CONSUMPTION



COMPRESSED AIR CONSUMPTION



ENERGY COST



Harita Units

Environmental Policy

We at Harita Seating Systems Limited (HSSL), Harita Rubber Products (HRP), Sundaram Plastics (SP) and Sundaram Clayton Limited (SCL) located in Harita complex, Belagondapalli, Hosur, are involved in manufacturing of automotive seating systems, engineering rubber components, engineering plastic components and aluminium die casting products respectively.

We are committed to continually improve our environmental performance by

- Conservation and/or optimal utilisation of water, oils, energy, compressed air and raw materials such as
  - Polyurethane chemicals, rexine, fabric and epoxy polyester powder by HSSL;
  - Raw rubber and chemical additives by HRP;
  - Plastic granules by SP and
  - Aluminium and die-coats by SCL.
- Controlling generation of emissions, effluents, solid wastes and noise.
- Complying with all applicable legal requirements.
- Training and building awareness among all our employees.
- Encouraging suppliers and contractors to become environmentally responsible.

We will communicate this policy to all employees and make available to the public.

01 October 2002

Special officer
C Narasimhan

Harita complex, Hosur Thally road, Belagondapalli, Hosur – 635114,
Dharmapuri dist., Tamilnadu

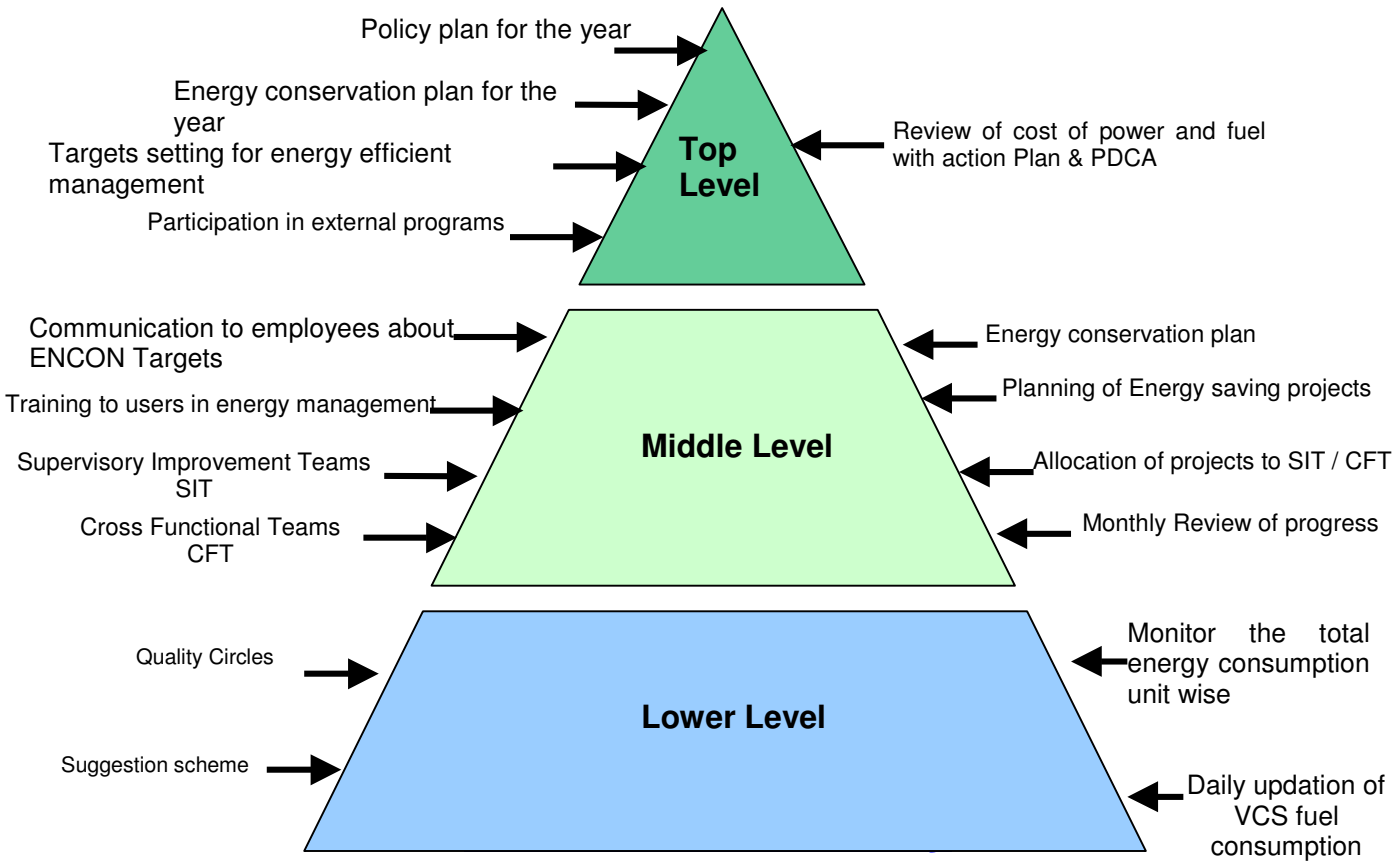
Energy conservation commitment, policy and set-up

HSSL strongly believes in integrating the environment with every sphere of our business activity through establishing a clear policy to ensure well being of the employees and society at large.

Energy conservation is nurtured as a culture at HSSL and forms part of actions initiated towards this commitment.

Energy Conservation Set up

Working System of Energy Management



Energy conservation achievements

From 1997 onwards, Harita Seating Systems is actively involved in inventing new ways of conserving energy. During the period of 1998 to 2005, 93 projects have been implemented to save energy to the tune of 92.15 Lakhs with an investment of 22.84 lakhs. This has resulted in a reduction of 41%in specific electrical energy consumption and 58 % in specific thermal energy consumption.

The major mile stone activities during the year 2004-05 are

1. Energy Substitution – Alternate Fuel

Old method

We have 7 tank automated pretreatment processes followed by spray type powder coating process for finishing the metal parts of our products. Sprayed powder coated parts are fed into a powder curing oven. High-speed diesel (HSD) is used as fuel to create thermal energy for baking the parts at 200deg C.

New Method

As an alternate method, we have modified the heating system with Liquefied Petroleum Gas (LPG) in place of HSD. The consumption of fuel is reduced. The temperature accuracy is maintained within one degree. We have achieved fuel saving of 40 – 45 %, since all the burnt fuel is converted into heat and there is no wastage. This is an environmental friendly system.

Savings	:Rs 11.14 Lakhs per annum
Investment	:2.5 Lakhs
Payback	:2.5 months

2. Redesign Operation Controls of Hydraulic Press (200 MT)

Old design of program

Hydraulic press is used for cutting and forming operation of fabrics, rexine and SRIM(structure reinforced injection moulding) products.
Earlier, the hydraulic power pack was working continuously throughout each cycle time. This results in huge power consumption.

New design of program

Trials were conducted by switching off he hydraulic power pack other than during cutting/forming operation. This showed a potential to reduce electrical power consumption. Hence, the hydraulic and electrical circuit is redesigned and modified to effect these changes for implementation of the project.

Savings	:	Rs 0.33 Lakhs per annum
Investment	:	0.2 Lakhs
Payback	:	7 months

3. Automatic Switching off compressor during unloading operation

Old method

We are using two pneumatic compressors of 55 kW each to support foaming, powder coating and assembly processes

Both compressors were operating simultaneously in three shifts continuously. The motors are working at 60 % load even during no load condition .

New Method

The compressor electrical and pressure control system are modified to operate both the compressor during peak load and switching off one compressor when the pressure reaches the max set point of 6.2 bar .

Savings	:	Rs 5.4 Lakhs per annum
Investment	:	0.5 Lakhs
Payback	:	2 months

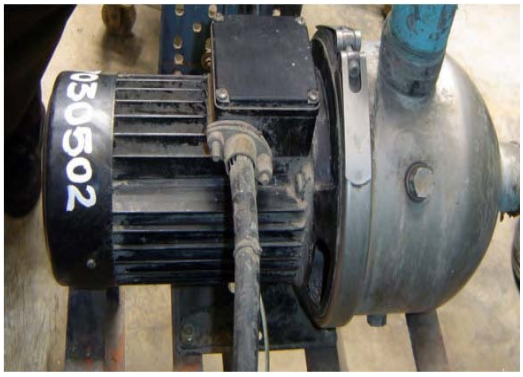
4. Higher efficiency low rating pumps

Old method

In our powder coating system, we were using 4 numbers of 5HP centrifugal pumps for circulating the chemicals for treatment process

New Method

The above said pumps are replaced with 0.75 KW, high energy low rating new generation compact pumps.



Savings	:	Rs 1.69 Lakhs per annum
Investment	:	0.92 Lakhs
Payback	:	7 months

5. Redesigning of oven control system

Old method

Dry off oven is used for drying of components in pretreatment process. The oven is equipped with blower for circulation of hot air inside the chamber. The blower is running continuously through out the day.

New Method

We observed that the blower is running continuously throughout even when there were no parts inside the oven.. The electrical control circuit has been modified to operate the blower only when the parts are placed inside the oven and oven door is closed. .

Savings	:	Rs 3.1 Lakhs per annum
Investment	:	0.45 Lakhs
Payback	:	2 months

6. FRP insulation for mould temperature control system

Old method

Mould temperature control system (MTCU) is used for maintaining the temperature of mould in the PU foaming process. 16 numbers of MTCU system are equipped with heater capacity of 3 kW for heating the media.Heat energy is dissipated to the atmosphere due to absence of insulation.

New Method

MTCU tanks are insulated with FRP which eliminates the heat losses and sustains the set temperature. Hence, the running time of the heater is reduced to a large extent.

Savings	:	Rs 3.95 Lakhs per annum
Investment	:	0.65 Lakhs
Payback	:	2 months

Other projects implemented during 2004-05

- Energy efficient motors for phosphating blowers.
- Low rating energy efficient pumps for chilling water circulation.
- Energy saving devices for rotary drive system.
- Solar heating for distilled water system.
- Switching off PC monitor during idle time.
- Modify electrical circuit for granulator machine.
- Modify electrical circuit for canteen grinder equipment.

Energy conservation Plan and Targets

Energy Conservation Measures Planned	Anticipated savings in energy (Rs. Lakhs)	Approx. investment (Rs.lakhs)	Project Commencement & Completion year
Conversion of variable frequency drives for motors	1.5	2.0	2005-2006
Conversion of fuel from SKO to LPG for pretreatment process operation	25.5	22.0	2005-2006
Energy efficient motors for process equipments	1.1	1.3	2005-2007
Solar heating for Mould temperature control	16.0	9.0	2005-2006
Energy efficient transformer for Power and	27.0	4.0	2005-2006
Mobile inverter for lighting	0.9	0.5	2005-2006
T5 energy saving lighting system for factory and	2.0	3.5	2005-2007
Automatic power factor controller - power system	3.2	1.5	2005-2006
Energy saving devices for air conditioning system	0.8	0.4	2005-2006

Adoption of "Clean Technology " and "Achieve Zero Accidents" is taken up as the company's goal

Environment & Safety

Clean and safe work environment

Harita seating systems is committed to protect the environment by Prevention of Pollution and continual improvement in our processes and systems to improve Environmental Performance. The company is ISO 14001 :2004(EMS) certified by BVQI and working towards implementation of OSHAS 18001.

In house audit is carried out every year and by a continuous process of educating the employees about the importance of effective utilisatiion and conservation of the natural

resources. The teams are motivated to implement “KAIZENS & KAIKAKUS” to optimise the consumption.

Followings are few examples :

- **Exhaust system for welding process**

- *120 air changesovers /hour*
- *5% reduction in Co2 and argon in air*
- *Improved ambient air quality*

Fig 1

- **Solar evaporation systems**

- *High TDS reject from effluent recycling*
- *Its stored for natural evopration*
- *Sludge after evopation is disposed as per TNPCB norms*

Fig 2

- **Acoustic enclosure for Granulator**

- *To reduce noise level below 85 dB*
- *Clean and safe work environment*

Fig 3

Safety audit: Safety committee comprising of 5 executives constituted each year conducts audit under the guidance of safety officer on monthly basis. Performance of each area is monitored through safety boards displayed at genba. This committee will raise NCRs (Non conformity report) in the areas of electrical, fire, use of PPE (Personal protective equipment), equipment and material handling system.

Audit process is as indicated in the Fig 5 .President reviews the NCRs and corrective actions every month. Safety shield will be awarded to the best units based on the performance

Fig 4

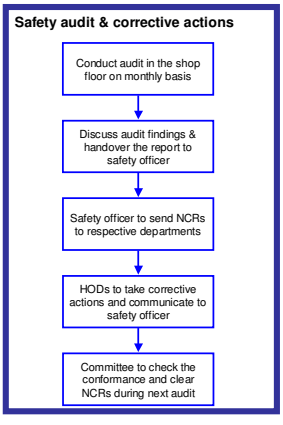


Fig 5

ENERGY CONSERVATION PROJECTS 2004-05

Trend setter project

Alternate high energy fuel for Powder Curing process

1.Background and observation of the project:

As a part of continuous energy conservation measure, we have looked at Thermal energy consumption as a potential area for reduction. We are using thermal energy in two areas:

1. Powder coating pretreatment process
2. Powder curing process

Upon observation we found the utilisation of thermal energy in powder curing is as low as 55%, which prompted as to work on a improvement project in this area.

Observation on Thermal energy transfer in powder curing oven

- High speed diesel (HSD)and Superior Kerosene oil (SKO) is used as a fuel
- HSD/SKO is fired through a burner and passed through the heat exchanger to heat the inner chamber of the oven , where the powder coated components are passed through for curing
- The exhaust flue gas is left out through a stack at a high temperature of 350 Deg C which is a waste.
- The residual heat in the exhaust flue gas need to be effectively utilised either in subsequent process or need to be eliminated to conserve energy
- Alternate (or) substitute fuel can be explored to eliminate
  1. Indirect heating
  2. Flue gas waste

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2. Technical and financial analysis & impact of the project:

Liquefied petroleum Gas (LPG) is proposed as an alternate fuel which has the following advantages over HSD/SKO

- High Calorific value of 12000 Kcal./kg as against HSD of 10400 Kcal./kg
- Direct heating is possible , hence elimination of heat exchanger,
- Very high efficiency with direct firing systems
- Can be circulated with in the Camel back oven, thereby eliminates flue gas exhaust through stack
- Cleaner & Environment friendly fuel

Hence detailed redesign exercise is carried out using a bank of LPG cylinders and modifying the burner and heating system.
We have invested Rs. 2.15 Lakhs for implementing this project, which gets paid back with in 2.5 months

This project is said to be the "Trendsetter" in its kind due to the following:

- Many seat manufacturers are using curing oven for backing powder coated / painted components.
- This LPG fuel system is unique implemented in Harita seating systems
- As a part of benchmarking, many seat-manufacturing units have been visited and observed that none of the units have implemented such ENCON measure.

Sl.no.	Project description	Background of the project	Observations made	Technical & financial analysis	Impact of implementation
1	Auto Chemical circulation through Solenoid operated valves	• Energy conservation measure • Wastage of energy due to two pumps running • Man-hours spent 25 hrs /annum	• Spares cost is more • Absence of Auto circulation results in excess energy consumption	• Feasible to install auto circulation of chemicals through solenoid valves • Investment of Rs 0.25 lakhs required with a payback of 3 months	• Installed the auto circulation which eliminated a motor of 3 KW • Savings of Rs.0.825 lakhs per annum For 2 machines = 1.65 lakhs
2	Redesign the Electrical circuit in Hydraulic press	• Hydraulic pump is kept always on through out the cycle	• Actuation of Hydraulic RAM is happening only at two places - Pressing and Retracting • Heavy leak in the system due to high temperature of hydraulic fluid	• Possibility to switch off the power pack operation during the ideal time • Redesign and modify the Electrical circuit by using limit switches to switch - off the hydraulic pump during ideal time	• Improved life of motor • Reduce the spare cost • Savings of Rs.0.33 lakhs per annum by energy conservation • Improved the plant utilisation
3	Redesign of chilling plant pump by energy efficient submersible pump	• Energy conservation • Space optimisation	• High energy consumption Failure of pump due to leak from seal • Chances for Air lock	• Feasible to modify the pump operation by installing energy efficient pumps - submersible type • Investment required is Rs 0.09 lakhs with a payback of 7 months.	• Optimised space from • Savings of Rs. 0.195 lakhs per annum • No impact on the process parameters
4	New generation high efficiency compact pumps for Trade Effluent Treatment process	• 4 nos. of Higher capacity heavy duty pumps are connected to treatment process	• Pumps are running through out the day • High energy consumption due to over design of the pumps	• Feasible to introduce High energy , compact new generation pumps • Investment required is Rs 0.92 lakhs with a payback of 7 months.	• Able to meet the requirement • Savings of Rs 1.70. Lakhs/ annum
5	Modify electrical circuit in dry off oven to reduce heat loss	• Energy conserrvation • High fuel consumption	• High power consumption • Waste in heat energy when door is open	• Feasible to install limit switch to control the operation • Investment required is Rs 0.92 lakhs with a payback of 7 months.	• Able to meet the requirement • Eliminate the waste heat loss • Savings of Rs. 1.54 lakhs by minimising fuel consumption
6	FRP insulation for MTCU system in Foaming process	• Energy conservation • Waste of heat energy	• Absence of insulation results in high heat loss and high energy consumption	• Feasible to introduce insulation with FRP for all the tanks	• Improved heating efficiency • Reduce down time • Savings of Rs. 4.0 lakhs

Sl.no.	Project description	Background of the project	Observations made	Technical & financial analysis	Impact of implementation
7	Automatic switching off compressor during unloading operation	• Energy conservation	• High spare cost • Motor is running @ 60 % load during no demand	• Feasible to install pressure control and timer system • Investment of Rs. 0.5 lakhs requires with a payback of 2 months	• Installed auto control system • Able to meet requirements • Saving s of Rs. 5.4 lakhs
8	Solar water heating system for Distilled water requirement	• Electrical heaters area used to produce distilled water	• More running hours of heaters • High Power consumption	• Feasible to install solar water heating system for heater of water • Investment required is Rs 7500 with a payback of 3.5 months.	• Renewable source of energy used • Safe working environment • Savings of Rs. 25000 / annum due to energy conservation
9	Redesign the Electrical circuit in Granulator machine cooling pump	• Cooling pump is kept ON always on thorough out the cycle	• Cooling is required only when the Granulator is running	• Possibility to switch off the cooling pump operation during the ideal time • Redesign and modify the Electrical circuit by using Electrical interlock to switch - off the cooling pump during ideal time	• Improved life of motor • Reduce the spare cost • Savings of Rs.15000 per annum due to wastage elimination • Improved the plant utilisation
10	Redesign the Electrical circuit in Canteen Grinder	• Energy conservation	• High energy consumption	• Feasible to modify the Grinder circuit with the preset timer • Investment required is Rs 2500with a payback of 1 month.	• Savings of Rs. 15000per annum per machine For 3 machines Rs. 45,000 / per annum
11	Replacement of Electrical heaters by LPG for cooking	• Electrical heaters are used for cooking purpose throughout the day,	• High energy consumption	• Feasible to introduce a LPG burners in canteen • Investment required is Rs12500 with a payback of 3 months.	• Better uitilisation of natural resources • Savings of 0.50 lakhs / annum
12	Redesign the Electrical circuit in MIG welding machine	• Cooling Fan is kept always on thorough out the cycle	• Cooling Fan is required only when the MIG welding machine	• Possibility to switch off the Fan operation during the ideal time • Redesign and modify the Electrical circuit by using Electrical interlock to switch - off the cooling Fan during ideal time	• Improved life of motor • Reduce the spare cost • Savings of Rs 7500 per annum due to wastage elimination
13	Conversion of fuel from SKO to LPG	• Energy conservation • Product quality • More smoke	• High thermal consumption • Poor quality of components • Pollution	• Quality of product improved due to no carbon deposition • Low calorific value to high calorific value	• Maximise utilisation of thermal energy, due to elimination due to waste heat recovery system • Savings of 11.14 lakhs / annum • Eliminate waste heat.